

# **WRITING FORMULAS (CRISS-CROSS METHOD)**

Name \_\_\_\_\_

Write the formulas of the compounds produced from the listed ions.

*Need to add  
charges!*

	Cl	CO <sub>3</sub>	OH	SO <sub>4</sub>	PO <sub>4</sub>	NO <sub>3</sub>
Na						
NH <sub>4</sub>						
K						
Ca						
Mg						
Zn						
Fe Ferric						
Al						
Co						
Fe Ferrous						
H						

# NAMING IONIC COMPOUNDS

Name \_\_\_\_\_

Name the following compounds using the Stock Naming System.

1.  $\text{CaCO}_3$  \_\_\_\_\_

2.  $\text{KCl}$  \_\_\_\_\_

3.  $\text{FeSO}_4$  \_\_\_\_\_

4.  $\text{LiBr}$  \_\_\_\_\_

5.  $\text{MgCl}_2$  \_\_\_\_\_

6.  $\text{FeCl}_3$  \_\_\_\_\_

7.  $\text{Zn}_3(\text{PO}_4)_2$  \_\_\_\_\_

8.  $\text{NH}_4\text{NO}_3$  \_\_\_\_\_

9.  $\text{Al}(\text{OH})_3$  \_\_\_\_\_

10.  $\text{CuC}_2\text{H}_3\text{O}_2$  \_\_\_\_\_

1.  $\text{PbSO}_3$  \_\_\_\_\_

2.  $\text{NaClO}_3$  \_\_\_\_\_

3.  $\text{CaC}_2\text{O}_4$  \_\_\_\_\_

4.  $\text{Fe}_2\text{O}_3$  \_\_\_\_\_

5.  $(\text{NH}_4)_3\text{PO}_4$  \_\_\_\_\_

6.  $\text{NaHSO}_4$  \_\_\_\_\_

7.  $\text{Hg}_2\text{Cl}_2$  \_\_\_\_\_

8.  $\text{Mg}(\text{NO}_2)_2$  \_\_\_\_\_

9.  $\text{CuSO}_4$  \_\_\_\_\_

10.  $\text{NaHCO}_3$  \_\_\_\_\_

11.  $\text{NiBr}_3$  \_\_\_\_\_

12.  $\text{Be}(\text{NO}_3)_2$  \_\_\_\_\_

13.  $\text{ZnSO}_4$  \_\_\_\_\_

14.  $\text{AuCl}_3$  \_\_\_\_\_

15.  $\text{KMnO}_4$  \_\_\_\_\_

## WRITING FORMULAS FROM NAMES

Name \_\_\_\_\_

Write the formulas of the following compounds.

1. ammonium phosphate \_\_\_\_\_
2. iron (II) oxide \_\_\_\_\_
3. iron (III) oxide \_\_\_\_\_
4. carbon monoxide \_\_\_\_\_
5. calcium chloride \_\_\_\_\_
6. potassium nitrate \_\_\_\_\_
7. magnesium hydroxide \_\_\_\_\_
8. aluminum sulfate \_\_\_\_\_
9. copper (II) sulfate \_\_\_\_\_
10. lead (IV) chromate \_\_\_\_\_
11. diphosphorus pentoxide \_\_\_\_\_
12. potassium permanganate \_\_\_\_\_
13. sodium hydrogen carbonate \_\_\_\_\_
14. zinc nitrate \_\_\_\_\_
15. aluminum sulfite \_\_\_\_\_

# NAMING MOLECULAR COMPOUNDS

Name \_\_\_\_\_

Name the following covalent compounds.

1.  $\text{CO}_2$  \_\_\_\_\_
2.  $\text{CO}$  \_\_\_\_\_
3.  $\text{SO}_2$  \_\_\_\_\_
4.  $\text{SO}_3$  \_\_\_\_\_
5.  $\text{N}_2\text{O}$  \_\_\_\_\_
6.  $\text{NO}$  \_\_\_\_\_
7.  $\text{N}_2\text{O}_3$  \_\_\_\_\_
8.  $\text{NO}_2$  \_\_\_\_\_
9.  $\text{N}_2\text{O}_4$  \_\_\_\_\_
10.  $\text{N}_2\text{O}_5$  \_\_\_\_\_
11.  $\text{PCl}_3$  \_\_\_\_\_
12.  $\text{PCl}_5$  \_\_\_\_\_
13.  $\text{NH}_3$  \_\_\_\_\_
14.  $\text{SCl}_6$  \_\_\_\_\_
15.  $\text{P}_2\text{O}_5$  \_\_\_\_\_
16.  $\text{CCl}_4$  \_\_\_\_\_
17.  $\text{SiO}_2$  \_\_\_\_\_
18.  $\text{CS}_2$  \_\_\_\_\_
19.  $\text{OF}_2$  \_\_\_\_\_
20.  $\text{PBr}_3$  \_\_\_\_\_

## NAMING ACIDS

Name \_\_\_\_\_

Name the following acids.

1.  $\text{HNO}_3$  \_\_\_\_\_
2.  $\text{HCl}$  \_\_\_\_\_
3.  $\text{H}_2\text{SO}_4$  \_\_\_\_\_
4.  $\text{H}_2\text{SO}_3$  \_\_\_\_\_
5.  $\text{HC}_2\text{H}_3\text{O}_2$  \_\_\_\_\_
6.  $\text{HBr}$  \_\_\_\_\_
7.  $\text{HNO}_2$  \_\_\_\_\_
8.  $\text{H}_3\text{PO}_4$  \_\_\_\_\_
9.  $\text{H}_2\text{S}$  \_\_\_\_\_
10.  $\text{H}_2\text{CO}_3$  \_\_\_\_\_

Write the formulas of the following acids.

11. sulfuric acid \_\_\_\_\_
12. nitric acid \_\_\_\_\_
13. hydrochloric acid \_\_\_\_\_
14. acetic acid \_\_\_\_\_
15. hydrofluoric acid \_\_\_\_\_
16. phosphorous acid \_\_\_\_\_
17. carbonic acid \_\_\_\_\_
18. nitrous acid \_\_\_\_\_
19. phosphoric acid \_\_\_\_\_
20. hydrosulfuric acid \_\_\_\_\_

Write the names for the following compounds

$\text{BaSO}_4 \cdot 2\text{H}_2\text{O}$  \_\_\_\_\_

$\text{N}_2\text{O}_6$  \_\_\_\_\_

$\text{Ca}(\text{ClO}_3)_2$  \_\_\_\_\_

$\text{H}_3\text{PO}_4$  \_\_\_\_\_

$\text{Mg}(\text{C}_2\text{H}_3\text{O}_2)_2$  \_\_\_\_\_

$\text{HClO}$  \_\_\_\_\_

$\text{CBr}_4$  \_\_\_\_\_

$\text{LiHCO}_3$  \_\_\_\_\_

$\text{NH}_3$  \_\_\_\_\_

$\text{H}_2\text{CO}_3$  \_\_\_\_\_

Write the formulas for the following compounds

sodium carbonate \_\_\_\_\_

ferric chlorate \_\_\_\_\_

lithium dichromate \_\_\_\_\_

phosphorous pentasulfide \_\_\_\_\_

silicon tetraiodide \_\_\_\_\_

calcium permanganate \_\_\_\_\_

phosphoric acid \_\_\_\_\_

nitrogen dioxide \_\_\_\_\_

chromic acid \_\_\_\_\_

hydrofluoric acid \_\_\_\_\_

Write the names for the following compounds

$\text{BaSO}_4 \cdot 2\text{H}_2\text{O}$  \_\_\_\_\_

$\text{N}_2\text{O}_6$  \_\_\_\_\_

$\text{Ca}(\text{ClO}_3)_2$  \_\_\_\_\_

$\text{H}_3\text{PO}_4$  \_\_\_\_\_

$\text{Mg}(\text{C}_2\text{H}_3\text{O}_2)_2$  \_\_\_\_\_

$\text{HClO}$  \_\_\_\_\_

$\text{CBr}_4$  \_\_\_\_\_

$\text{LiHCO}_3$  \_\_\_\_\_

$\text{NH}_3$  \_\_\_\_\_

$\text{H}_2\text{CO}_3$  \_\_\_\_\_

Write the formulas for the following compounds

sodium carbonate \_\_\_\_\_

ferric chlorate \_\_\_\_\_

lithium dichromate \_\_\_\_\_

phosphorous pentasulfide \_\_\_\_\_

silicon tetraiodide \_\_\_\_\_

calcium permanganate \_\_\_\_\_

phosphoric acid \_\_\_\_\_

nitrogen dioxide \_\_\_\_\_

chromic acid \_\_\_\_\_

hydrofluoric acid \_\_\_\_\_

Name \_\_\_\_\_

Date \_\_\_\_\_

Chemistry AF  
Naming Compounds Practice

**Directions.** Give the name or formula for each compound. Start by determining what type of compound it is.

- |  |                           |
|--|---------------------------|
| 1. KSCN  | 16. calcium hydroxide     |
| 2. $\text{Fe}(\text{ClO}_3)_2$                 | 17. acetic acid           |
| 3. $\text{Zn}(\text{NO}_3)_2$                  | 18. phosphorus tribromide |
| 4. $\text{N}_2\text{O}_3$                      | 19. hydrofluoric acid     |
| 5. $\text{NaHCO}_3$                            | 20. sulfur hexachloride   |
| 6. $\text{H}_2\text{CO}_3$                     | 21. iron(III) chromate    |
| 7. $\text{KMnO}_4$                             | 22. hydronium sulfide     |
| 8. HF  | 23. phosphoric acid       |
| 9. $\text{NH}_4\text{C}_2\text{H}_3\text{O}_2$ | 24. mercury(II) chloride  |
| 10. $\text{MgSO}_4$                            | 25. copper(I) acetate     |
| 11. $\text{SO}_2$                              | 26. aluminum hydroxide    |
| 12. $(\text{NH}_4)_3\text{PO}_4$               | 27. carbon disulfide      |
| 13. $\text{P}_2\text{O}_5$                     | 28. hydrobromic acid      |
| 14. $\text{CuSO}_4$                            | 29. ammonium phosphate    |
| 15. $\text{CO}_2$                              | 30. barium hydroxide      |

Write the name for the following compounds. Use the Stock system where appropriate.

- |   |                                 |  |
|---|---------------------------------|--|
| 1 $\text{NH}_4\text{NO}_2$ _____                      | 13 $\text{SiO}_2$ _____         | 20 $\text{K}_2\text{SO}_3$ _____       |
| 2 $\text{Ca}(\text{HCO}_3)_2$ _____                   | _____                           | 21 $\text{Cu}_2\text{S}$ _____         |
| 3 $\text{Ba}(\text{ClO}_3)_2$ _____                   | 14 $\text{PCl}_3$ _____         | 22 $\text{KHSO}_4$ _____               |
| 4 $\text{Hg}_2\text{I}_2$ _____                       | _____                           | 23 $\text{ZnBr}_2$ _____               |
| 5 $\text{KCN}$ _____                                  | 15 $\text{SiF}_4$ _____         | 24 $\text{Fe}_2(\text{CrO}_4)_3$ _____ |
| 6 $\text{PbO}_2$ _____                                | _____                           | 25 $\text{NaClO}_4$ _____              |
| 7 $\text{KSCN}$ _____                                 | 16 $\text{N}_2\text{O}$ _____   | 26 $\text{KClO}$ _____                 |
| 8 $\text{Zn}(\text{C}_2\text{H}_3\text{O}_2)_2$ _____ | _____                           | 27 $\text{Mg}_3\text{N}_2$ _____       |
| 9 $\text{K}_2\text{SO}_4$ _____                       | 17 $\text{SO}_3$ _____          | 28 $\text{Na MnO}_4$ _____             |
| 10 $\text{Hg}(\text{OH})_2$ _____                     | _____                           | 29 $\text{KMnO}_4$ _____               |
| 11 $\text{N}_2\text{O}_5$ _____                       | 18 $\text{ClO}_2^-$ _____       | 30 $\text{NO}$ _____                   |
| _____   | _____                           | _____                                  |
| 12 $\text{IF}_5$ _____                                | 19 $\text{P}_4\text{S}_3$ _____ | 31 $\text{SF}_4$ _____                 |
| _____   | _____                           | _____                                  |

Write chemical formulas for the following compounds

- |                               |                             |                              |
|-------------------------------|-----------------------------|------------------------------|
| 31 Mercury (I) Cyanide _____  | 41 Sodium Nitrite _____     | 51 Potassium Carbonate _____ |
| 32 Hydrosulfuric Acid _____   | 42 Iron(III) Oxide _____    | 52 Silver Sulfide _____      |
| 33 Iron (II) Acetate _____    | 43 Aluminum Hydroxide _____ | 53 Nitrous Acid _____        |
| 34 Potassium Chlorate _____   | 44 Ammonium Hydroxide _____ | 54 Calcium Phosphate _____   |
| 35 Lead (II) Fluoride _____   | 45 Magnesium Chloride _____ | 55 Copper(II) Nitrate _____  |
| 36 Hydrobromic Acid _____     | 46 Hydrochloric Acid _____  | 56 Magnesium Sulfide _____   |
| 37 Ammonium Oxalate _____     | 47 Cuprous Oxide _____      | 57 Aluminum Oxide _____      |
| 38 Mercury(II) Chromate _____ | 48 Potassium Sulfate _____  | 58 Barium Nitride _____      |
| 39 Silver Phosphate _____     | 49 Zinc Oxide _____         | 59 Lead(II) Sulfate _____    |
| 40 Potassium Dichromate _____ | 50 Barium Sulfite _____     | 60 Hypochlorous Acid _____   |



# GRAM FORMULA MASS

Name \_\_\_\_\_

determine the gram formula mass (the mass of one mole) of each compound below.



\_\_\_\_\_



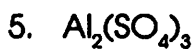
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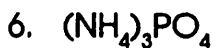
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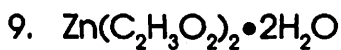
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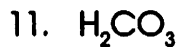
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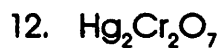
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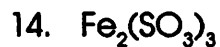
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\_\_\_\_\_



\_\_\_\_\_



\_\_\_\_\_



\_\_\_\_\_

# THE MOLE AND AVOGADRO'S NUMBER

Name \_\_\_\_\_

One mole of a substance contains Avogadro's Number ( $6.02 \times 10^{23}$ ) of molecules.

How many molecules are in the quantities below?

1. 2.0 moles

2. 1.5 moles

3. 0.75 mole

4. 15 moles

5. 0.35 mole

How many moles are in the number of molecules below?

1.  $6.02 \times 10^{23}$

2.  $1.204 \times 10^{24}$

3.  $1.5 \times 10^{20}$

4.  $3.4 \times 10^{26}$

5.  $7.5 \times 10^{19}$

# MOLES AND MASS

Name \_\_\_\_\_

Determine the number of moles in each of the quantities below.

1. 25 g of NaCl

2. 125 g of  $\text{H}_2\text{SO}_4$

3. 100. g of  $\text{KMnO}_4$

4. 74 g of KCl

5. 35 g of  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$

Determine the number of grams in each of the quantities below.

1. 2.5 moles of NaCl

2. 0.50 moles of  $\text{H}_2\text{SO}_4$

3. 1.70 moles of  $\text{KMnO}_4$

4. 0.25 moles of KCl

5. 3.2 moles of  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$

## Mole Concept –Hello Old Friend

Use the formula for ferrous phosphate to determine the following:

Mass of a Mole

Formula Weight

% composition of O

Mass of one formula unit

# of atoms in one ferrous phosphate formula unit

# of formula units in one mole

# of atoms in a mole of it

# of O atoms in a formula unit

# of Fe atoms in a formula unit

# of P atoms in a formula unit

# of O atoms in a mole

# of Fe atoms in a mole

# of P atoms in a mole

Convert  $4.01 \times 10^{16}$  formula units of it to grams

How many moles of O are in 32 g of it?

How many atoms of P are in 67 g of it?

How many electrons that contributed from iron (II) are there in 55g of it?

Find the mass of 0.89 mol of  $\text{CaCl}_2$ .

Determine the number of atoms that are in 0.58 mol of Se.

A bottle of  $\text{PbSO}_4$  contains 158.1 g of the compound. How many moles of  $\text{PbSO}_4$  are in the bottle?

How many moles of barium nitrate ( $\text{BaNO}_3$ ) contain  $6.80 \times 10^{24}$  formula units?

Find the mass of 1.112 mol of HF.

Determine the number of atoms that are in 1.25 mol of  $\text{O}_2$ .

Determine the number of moles of  $\text{C}_5\text{H}_{12}$  that are in 362.8 g of the compound.

How many moles of magnesium bromide ( $\text{MgBr}_2$ ) contain  $5.38 \times 10^{24}$  formula units?

How many formula units are in 1.4 g of  $\text{PbCl}_2$ ?

If you burned  $6.10 \times 10^{24}$  molecules of ethane ( $\text{C}_2\text{H}_6$ ), what mass of ethane did you burn?

Determine the mass of  $2.94 \times 10^{24}$  molecules of decane ( $\text{C}_{10}\text{H}_{22}$ ).

How many formula units are in 5.1 g of  $\text{TiO}_2$ ?

How many formula units are in 5.6 g of  $\text{H}_2\text{S}$ ?

What is the mass of  $3.62 \times 10^{24}$  molecules of methanol ( $\text{CH}_3\text{OH}$ )?

A bottle of  $\text{KMnO}_4$  contains 66.38 g of the compound. How many moles of  $\text{KMnO}_4$  does it contain?

How many formula units are in 3.5 g of NaOH?

# PERCENTAGE COMPOSITION

Name \_\_\_\_\_

Determine the percentage composition of each of the compounds below.



K = \_\_\_\_\_

Mn = \_\_\_\_\_

O = \_\_\_\_\_



H = \_\_\_\_\_

Cl = \_\_\_\_\_



Mg = \_\_\_\_\_

N = \_\_\_\_\_

O = \_\_\_\_\_

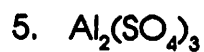


N = \_\_\_\_\_

H = \_\_\_\_\_

P = \_\_\_\_\_

O = \_\_\_\_\_



Al = \_\_\_\_\_

S = \_\_\_\_\_

O = \_\_\_\_\_

Solve the following problems.

6. How many grams of oxygen can be produced from the decomposition of 100. g of  $\text{KClO}_3$ ? \_\_\_\_\_

7. How much iron can be recovered from 25.0 g of  $\text{Fe}_2\text{O}_3$ ? \_\_\_\_\_

8. How much silver can be produced from 125 g of  $\text{Ag}_2\text{S}$ ? \_\_\_\_\_

# DETERMINING EMPIRICAL FORMULAS

Name \_\_\_\_\_

What is the empirical formula (lowest whole number ratio) of the compounds below?

1. 75% carbon, 25% hydrogen

\_\_\_\_\_

2. 52.7% potassium, 47.3% chlorine

\_\_\_\_\_

3. 22.1% aluminum, 25.4% phosphorus, 52.5% oxygen

\_\_\_\_\_

4. 13% magnesium, 87% bromine

\_\_\_\_\_

5. 32.4% sodium, 22.5% sulfur, 45.1% oxygen

\_\_\_\_\_

6. 25.3% copper, 12.9% sulfur, 25.7% oxygen, 36.1% water

\_\_\_\_\_

## DETERMINING MOLECULAR FORMULAS (TRUE FORMULAS)

Name \_\_\_\_\_

Solve the problems below.

1. The empirical formula of a compound is  $\text{NO}_2$ . Its molecular mass is 92 g/mol. What is its molecular formula?

\_\_\_\_\_

2. The empirical formula of a compound is  $\text{CH}_2$ . Its molecular mass is 70 g/mol. What is its molecular formula?

\_\_\_\_\_

3. A compound is found to be 40.0% carbon, 6.7% hydrogen and 53.5% oxygen. Its molecular mass is 60. g/mol. What is its molecular formula?

\_\_\_\_\_

4. A compound is 64.9% carbon, 13.5% hydrogen and 21.6% oxygen. Its molecular mass is 74 g/mol. What is its molecular formula?

\_\_\_\_\_

5. A compound is 54.5% carbon, 9.1% hydrogen and 36.4% oxygen. Its molecular mass is 88 g/mol. What is its molecular formula?

\_\_\_\_\_



# COMPOSITION OF HYDRATES

Name \_\_\_\_\_

A hydrate is an ionic compound with water molecules loosely bonded to its crystal structure. The water is in a specific ratio to each formula unit of the salt. For example, the formula  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$  indicates that there are five water molecules for every one formula unit of  $\text{CuSO}_4$ . Answer the questions below.

1. What percentage of water is found in  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ ?

\_\_\_\_\_

2. What percentage of water is found in  $\text{Na}_2\text{S} \cdot 9\text{H}_2\text{O}$ ?

\_\_\_\_\_

3. A 5.0 g sample of a hydrate of  $\text{BaCl}_2$  was heated, and only 4.3 g of the anhydrous salt remained. What percentage of water was in the hydrate?

\_\_\_\_\_

4. A 2.5 g sample of a hydrate of  $\text{Ca}(\text{NO}_3)_2$  was heated, and only 1.7 g of the anhydrous salt remained. What percentage of water was in the hydrate?

\_\_\_\_\_

5. A 3.0 g sample of  $\text{Na}_2\text{CO}_3 \cdot \text{H}_2\text{O}$  is heated to constant mass. How much anhydrous salt remains?

\_\_\_\_\_

6. A 5.0 g sample of  $\text{Cu}(\text{NO}_3)_2 \cdot n\text{H}_2\text{O}$  is heated, and 3.9 g of the anhydrous salt remains. What is the value of n?

\_\_\_\_\_

Formula Calculation Worksheet  
(also do 11-16 on page 231)

A compound is found to contain 36.48% of sodium, 25.41% sulfur, and 38.02% oxygen. Find its simplest formula.

Find the simplest formula of a compound that contains 53.70% iron and 46.30% sulfur.

Analysis of a compound indicates that it contains 1.04g K, 0.7g Cr, and 0.82g O. What is its simplest formula?

4.04g of N combine with 11.46g of O to produce a compound with a formula mass of 108.0 g/mol. What are the simplest formula and molecular formulas of these compounds?

The formula mass of a compound is 92u. Analysis of this compound indicates that it contains 0.606g N and 1.390g O. What are its empirical and molecular formulas.

## FORMULAS AND NAMES

Write the names for the following compounds. Use the Stock system where appropriate.

- |  |  |
|--|--|
| 1. $\text{CaCO}_3$ _____               | 11. $\text{H}_2\text{SO}_4$ _____          |
| 2. $\text{FeO}$ _____                  | 12. $\text{Zn}(\text{NO}_3)_2$ _____       |
| 3. $\text{H}_2\text{CO}_3$ _____       | 13. $\text{CuSO}_4$ _____                  |
| 4. $\text{Ca}_3(\text{PO}_4)_2$ _____  | 14. $\text{AlCl}_3$ _____                  |
| 5. $\text{AgCl}$ _____                 | 15. $\text{NaOH}$ _____                    |
| 6. $\text{Ba}(\text{OH})_2$ _____      | 16. $\text{PbCl}_2$ _____                  |
| 7. $\text{Na}_2\text{S}$ _____         | 17. $\text{KNO}_3$ _____                   |
| 8. $\text{FeCl}_2$ _____               | 18. $\text{Mg}(\text{OH})_2$ _____         |
| 9. $\text{H}_2\text{CrO}_4$ _____      | 19. $\text{HClO}_3$ _____                  |
| 10. $(\text{NH}_4)_2\text{SO}_4$ _____ | 20. $\text{H}_2\text{C}_2\text{O}_4$ _____ |

write chemical formulas for the following compounds

- |                              |                               |
|------------------------------|-------------------------------|
| 21. Sodium Nitrite _____     | 31. Potassium Carbonate _____ |
| 22. Iron(III)Oxide. _____    | 32. Silver Sulfide _____      |
| 23. Aluminum Hydroxide _____ | 33. Nitrous Acid _____        |
| 24. Ammonium Hydroxide _____ | 34. Calcium Phosphate _____   |
| 25. Magnesium Chloride _____ | 35. Copper(II)Nitrate _____   |
| 26. Hydrochloric Acid _____  | 36. Magnesium Sulfide _____   |
| 27. Cuprous Oxide _____      | 37. Aluminum Oxide _____      |
| 28. Potassium Sulfate _____  | 38. Barium Nitride _____      |
| 29. Zinc Oxide _____         | 39. Lead(II)Sulfate _____     |
| 30. Barium Sulfite _____     | 40. Hypochlorous Acid _____   |

Write the name for the following compounds. Use the Stock system where appropriate.

41.  $\text{NH}_4\text{NO}_2$  \_\_\_\_\_ 51.  $\text{K}_2\text{SO}_3$  \_\_\_\_\_

42.  $\text{Ca}(\text{HCO}_3)_2$  \_\_\_\_\_ 52.  $\text{Cu}_2\text{S}$  \_\_\_\_\_

43.  $\text{Ba}(\text{ClO}_3)_2$  \_\_\_\_\_ 53.  $\text{KHSO}_4$  \_\_\_\_\_

44.  $\text{Hg}_2\text{I}_2$  \_\_\_\_\_ 54.  $\text{ZnBr}_2$  \_\_\_\_\_

45.  $\text{KCN}$  \_\_\_\_\_ 55.  $\text{Fe}_2(\text{CrO}_4)_3$  \_\_\_\_\_

46.  $\text{PbO}_2$  \_\_\_\_\_ 56.  $\text{NaClO}_4$  \_\_\_\_\_

47.  $\text{KSCN}$  \_\_\_\_\_ 57.  $\text{KClO}$  \_\_\_\_\_

48.  $\text{Zn}(\text{C}_2\text{H}_3\text{O}_2)_2$  \_\_\_\_\_ 58.  $\text{Mg}_3\text{N}_2$  \_\_\_\_\_

49.  $\text{K}_2\text{SO}_4$  \_\_\_\_\_ 59.  $\text{Na}_2\text{MnO}_4$  \_\_\_\_\_

50.  $\text{Hg}(\text{OH})_2$  \_\_\_\_\_ 60.  $\text{KMnO}_4$  \_\_\_\_\_

Write chemical formulas for the following compounds

61. Mercury (I) Cyanide \_\_\_\_\_ 71. Barium Nitride \_\_\_\_\_

62. Hydrosulfuric Acid \_\_\_\_\_ 72. Sodium Peroxide \_\_\_\_\_

63. Iron (II) Acetate \_\_\_\_\_ 73. Cupric Bromide \_\_\_\_\_

64. Potassium Chlorate \_\_\_\_\_ 74. Ammonium Sulfide \_\_\_\_\_

65. Lead (II) Fluoride \_\_\_\_\_ 75. Calcium Nitrate \_\_\_\_\_

66. Hydrobromic Acid \_\_\_\_\_ 76. Zinc Hydroxide \_\_\_\_\_

67. Ammonium Oxalate \_\_\_\_\_ 77. Sodium Hydrogen Carbonate \_\_\_\_\_

68. Mercury(II) Chromate \_\_\_\_\_ 78. Lead (IV) Oxide \_\_\_\_\_

69. Silver Phosphate \_\_\_\_\_ 79. Potassium Perchlorate \_\_\_\_\_

70. Potassium Dichromate \_\_\_\_\_ 80. Mercurous Iodide \_\_\_\_\_

## CHAPTER 7 REVIEW

### Chemical Formulas and Chemical Compounds

#### MIXED REVIEW

**SHORT ANSWER** Answer the following questions in the space provided.

- Write formulas for the following compounds:
  - copper(II) carbonate  
\_\_\_\_\_
  - sodium sulfite  
\_\_\_\_\_
  - ammonium phosphate  
\_\_\_\_\_
  - tin(IV) sulfide  
\_\_\_\_\_
  - nitrous acid  
\_\_\_\_\_
- Write the ~~stock~~ names for the following compounds:
  - $\text{Mg}(\text{ClO}_4)_2$   
\_\_\_\_\_
  - $\text{Fe}(\text{NO}_3)_2$   
\_\_\_\_\_
  - $\text{Fe}(\text{NO}_2)_3$   
\_\_\_\_\_
  - $\text{CoO}$   
\_\_\_\_\_
  - dinitrogen pentoxide  
\_\_\_\_\_
- How many atoms are represented by the formula  $\text{Ca}(\text{HSO}_4)_2$ ?  
\_\_\_\_\_
  - How many moles of oxygen atoms are in a 0.50 mol sample of this compound?  
\_\_\_\_\_
  - Assign the oxidation number to sulfur in the  $\text{HSO}_4^-$  anion.  
\_\_\_\_\_
- Assign the oxidation number to the element specified in each of the following:
  - hydrogen in  $\text{H}_2\text{O}_2$   
\_\_\_\_\_
  - hydrogen in  $\text{MgH}_2$   
\_\_\_\_\_
  - sulfur in  $\text{S}_8$   
\_\_\_\_\_
  - carbon in  $(\text{CO}_3)^{2-}$   
\_\_\_\_\_
  - chromium in  $\text{Na}_2\text{Cr}_2\text{O}_7$   
\_\_\_\_\_
  - nitrogen in  $\text{NO}_2$   
\_\_\_\_\_

#### MIXED REVIEW continued

**PROBLEMS** Write the answer on the line to the left. Show all your work in the space provided.

- \_\_\_\_\_ Following are samples of four different compounds. Arrange them in order of increasing mass, from smallest to largest.

a. 25 g of oxygen gas	c. $3 \times 10^{23}$ molecules of $\text{C}_2\text{H}_6$
b. 1.00 mol of $\text{H}_2\text{O}$	d. $2 \times 10^{23}$ molecules of $\text{C}_2\text{H}_6\text{O}_2$
- What is the formula for sodium hydroxide?  
\_\_\_\_\_
  - What is the formula mass of sodium hydroxide?  
\_\_\_\_\_
  - What is the mass in grams of 0.25 mol of sodium hydroxide?  
\_\_\_\_\_
- \_\_\_\_\_ What is the percentage composition of ethane gas,  $\text{C}_2\text{H}_6$ , to the nearest whole number?
- \_\_\_\_\_ Ribose is an important sugar (part of RNA), with a molar mass of 150.15 g/mol. If its empirical formula is  $\text{CH}_2\text{O}$ , what is its molecular formula?

## CHAPTER 7 REVIEW

### Chemical Formulas and Chemical Compounds

#### SECTION 7-4

**SHORT ANSWER** Answer the following questions in the space provided.

1. Write empirical formulas to match the following molecular formulas:

- \_\_\_\_\_ a.  $C_2H_6O_4$   
 \_\_\_\_\_ b.  $N_2O_5$   
 \_\_\_\_\_ c.  $Hg_2Cl_2$   
 \_\_\_\_\_ d.  $C_6H_{12}$

2. \_\_\_\_\_ A certain hydrocarbon has an empirical formula of  $CH_2$  and a molar mass of 56.12 g/mol. What is its molecular formula?

3. A certain ionic compound is found to contain 0.012 mol of sodium, 0.012 mol of sulfur, and 0.018 mol of oxygen.

- \_\_\_\_\_ a. What is its empirical formula?  
 \_\_\_\_\_ b. Is this compound a sulfate, sulfite, or neither?

**PROBLEMS** Write the answer on the line to the left. Show all your work in the space provided.

4. Water of hydration was discussed in Sample Problem 7-11 on pages 227–228 of the text. Strong heating will drive off the water as a vapor in hydrated copper(II) sulfate. Use the data table below to answer the following:

Mass of the empty crucible	4.00 g
Mass of the crucible plus hydrate sample	4.50 g
Mass of the system after heating	4.32 g
Mass of the system after a second heating	4.32 g

- \_\_\_\_\_ a. Determine the percent water of hydration in the original sample.

#### SECTION 7-4 continued

\_\_\_\_\_ b. The compound has the formula  $CuSO_4 \cdot xH_2O$ . Determine value of  $x$ .

c. What might be the purpose of the second heating?

5. Gas X is found to be 24.0% carbon and 76.0% fluorine by mass.

\_\_\_\_\_ a. Determine the empirical formula of gas X.

\_\_\_\_\_ b. Given that the molar mass of gas X is 200.04 g/mol, determine its molecular formula.

6. A compound is found to contain 43.2% copper, 24.1% chlorine, and 32.7% oxygen by mass.

\_\_\_\_\_ a. Determine its empirical formula.

b. What is the correct Stock name of the compound in part a?